

REMARKS

All claims were rejected for non-statutory double patenting. Without acquiescing to that rejection, but to expedite prosecution, a Terminal Disclaimer to overcome that rejection is attached.

Claims 4, 5, 7, and 8 were only rejected based on double patenting. Accordingly, those claims should now be allowable. Those claims have additionally been redrafted as claims 11-14.

Claims 1-3 and 9-10 were rejected under 35 U.S.C. §102(e) as being anticipated by Turner, *et al.*, (6,018,524), and claim 6 was rejected under 35 U.S.C. §103 as being unpatentable over Turner in view of Ferguson, *et al.*, (5,909,440). Those rejections are respectfully traversed and reconsideration is requested.

The present invention is directed to a method of performing prefix searches from a prefix search tree data structure. In a forward pass of that data structure, prefix search comparisons of search keys and data from the data structure are made to determine memory addresses of nodes of the tree data structure and to obtain prefix search results.

In accordance with the invention, multiple prefix search keys are distributed to plural prefix search engines in order to enable prefix search processing of the keys in parallel. In a preferred embodiment, the search keys are distributed over a network from an input queue as the engines become idle, and the results of the searches are forwarded over the network to an output queue in an order independent of the order in the input queue. The results of the searches are there ordered to their order of arrival at the input queue.

In addition to having parallel search engines, the prefix search tree data structure may be stored across plural banks of memory units with the tree structure being accessed in successive read cycles.

Turner, *et al.* relates to a novel data structure for prefix searches which relies on a binary search of a trie structure. Accordingly, it is questioned whether comparisons are made in a forward pass of a tree data structure toward a leaf. More significantly, however, there is no suggestion in Turner, *et al.* of a distributing prefix searches to plural prefix search engines (claim 1). In particular, there is no teaching of distributing prefix search keys to plural engines over a network from an input queue and forwarding results of the searches over the network to an output queue in a different order (claim 2).

For a teaching of distributing prefix search keys to plural prefix search engines, the Examiner has cited column 16, lines 22-35 of Turner, *et al.*, and for the distribution over a network between input and output queues recited in claim 2, the Examiner has more broadly cited column 16, lines 11-50. Although Turner, *et al.* indicates that a processing subsystem of a router could be a group of processors, there is no suggestion of distributing prefix search keys to plural prefix search engines. The more likely interpretation of Turner, *et al.*, would be that there would be a separate prefix search engine at each input link. Search engines might be distributed across the multiple inputs, but there would be no distribution of search keys from a single input to plural prefix search engines. To emphasize this distinction, claim 1 has been amended.

There is certainly no suggestion in Turner, *et al.* of distributing prefix search keys from an input queue over a network to plural search engines (claim 2) or of reordering the prefix search results in an output queue (claim 3).

With respect to claim 9, there is no mention in Turner, *et al.* of memory addresses. With respect to claim 10, there is no mention of comparing against plural stored keys. The data structure of Turner, *et al.* stores only one prefix at each node.

Ferguson, *et al.* does not overcome any of the deficiencies of Turner, *et al.* Ferguson, *et al.* does not determine memory addresses of nodes of the tree structure in a forward pass of the tree structure but rather traverses to a leaf node and then backtracks to find the last matching

node. Nor does Ferguson, *et al.* suggest storing the data structure across plural banks of memory units and accessing the tree structure in successive read cycles.

CONCLUSION

In view of the above amendments and remarks, it is believed that all claims are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned.

Respectfully submitted,

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.

By 
James M. Smith
Registration No. 28,043
Telephone: (978) 341-0036
Facsimile: (978) 341-0136

Concord, MA 01742-9133

Dated:

1/12/84